

# Accelerating ITS Implementation - Applying Past Experience to Achieve Future Success

## Longitudinal Study of ITS Implementation Findings

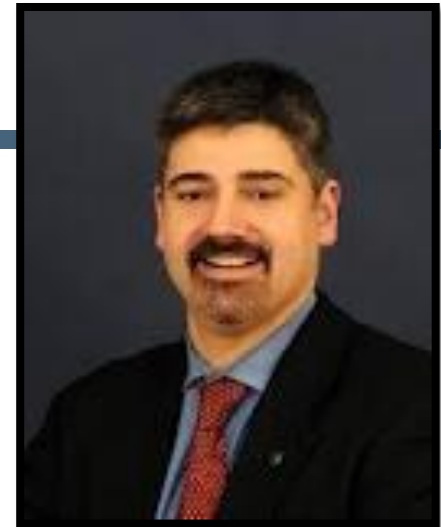
May 08, 2013



# Welcome

## Webinar Objectives:

- Share key study insights and considerations for accelerating implementation of the next generation ITS and the connected vehicle environment.
- Highlight compelling ITS stories identified among interviews with highway, transit and tolling agencies, as well as police, emergency services, and others at the state, MPO, county and city levels.
- Solicit your feedback on key themes to inform ITS JPO strategies for accelerating ITS implementation.



**James Pol**

*Team Lead*

*Program Management and Evaluation  
USDOT - ITS Joint Program Office*

# Today's Webinar

## *Presenters*



**Vaishali Shah**  
*Noblis*



**Carolina Burnier**  
*Noblis*

## *Expert Panel*



**Bill Ball**  
*Merriweather Advisors LLC*



**Dan Murray**  
*American  
Transportation  
Research Institute*



**Doug Sallman**  
*Cambridge Systematics*

# LSI Study Questions

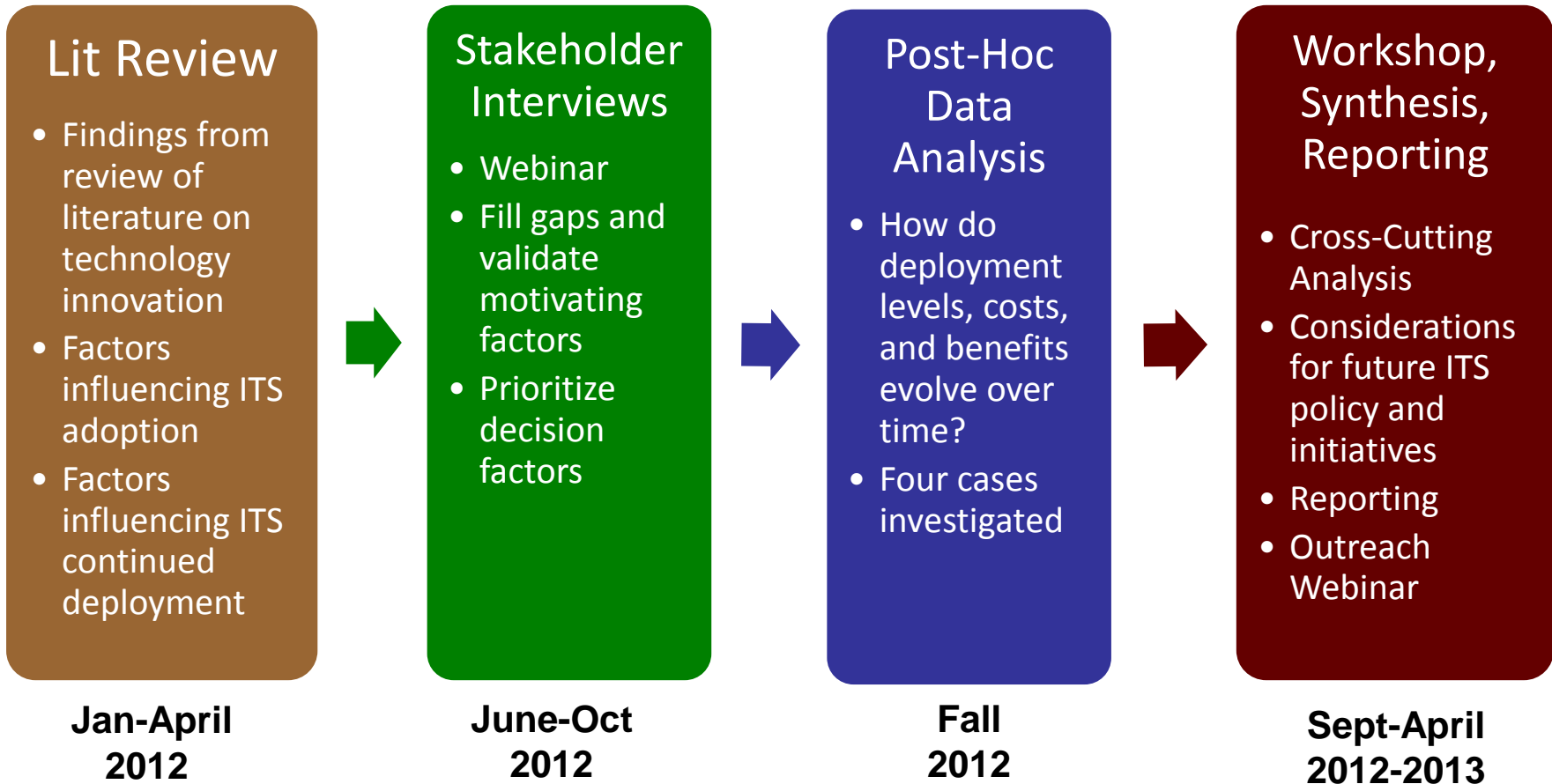
- What are the most important factors that influence adoption, growth, replacement or cancellation of ITS technology? How do they differ between the public and private sectors?
- Does expansion of an ITS deployment produce a higher level of benefits? Do benefits trail off if an ITS deployment is operated for a long period?
- What information and delivery methods best support stakeholders in making ITS planning, implementation, O&M, and replacement decisions?
- What can the U.S. DOT do to accelerate ITS technology implementation? What is the applicability of these strategies to connected vehicle advances and next generation ITS?

***Look at past ITS deployment decisions  
to influence adoption of next generation ITS***



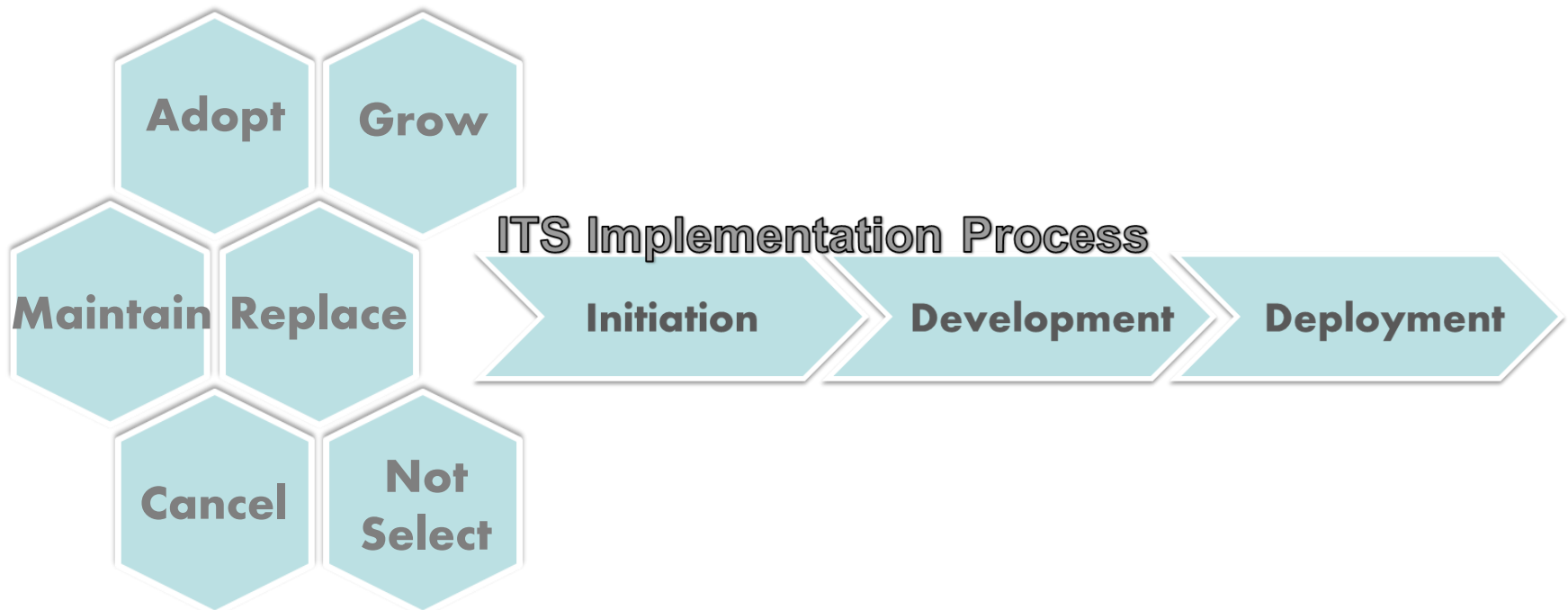
# Longitudinal Study of ITS Implementation

## Four Stages



Q1.

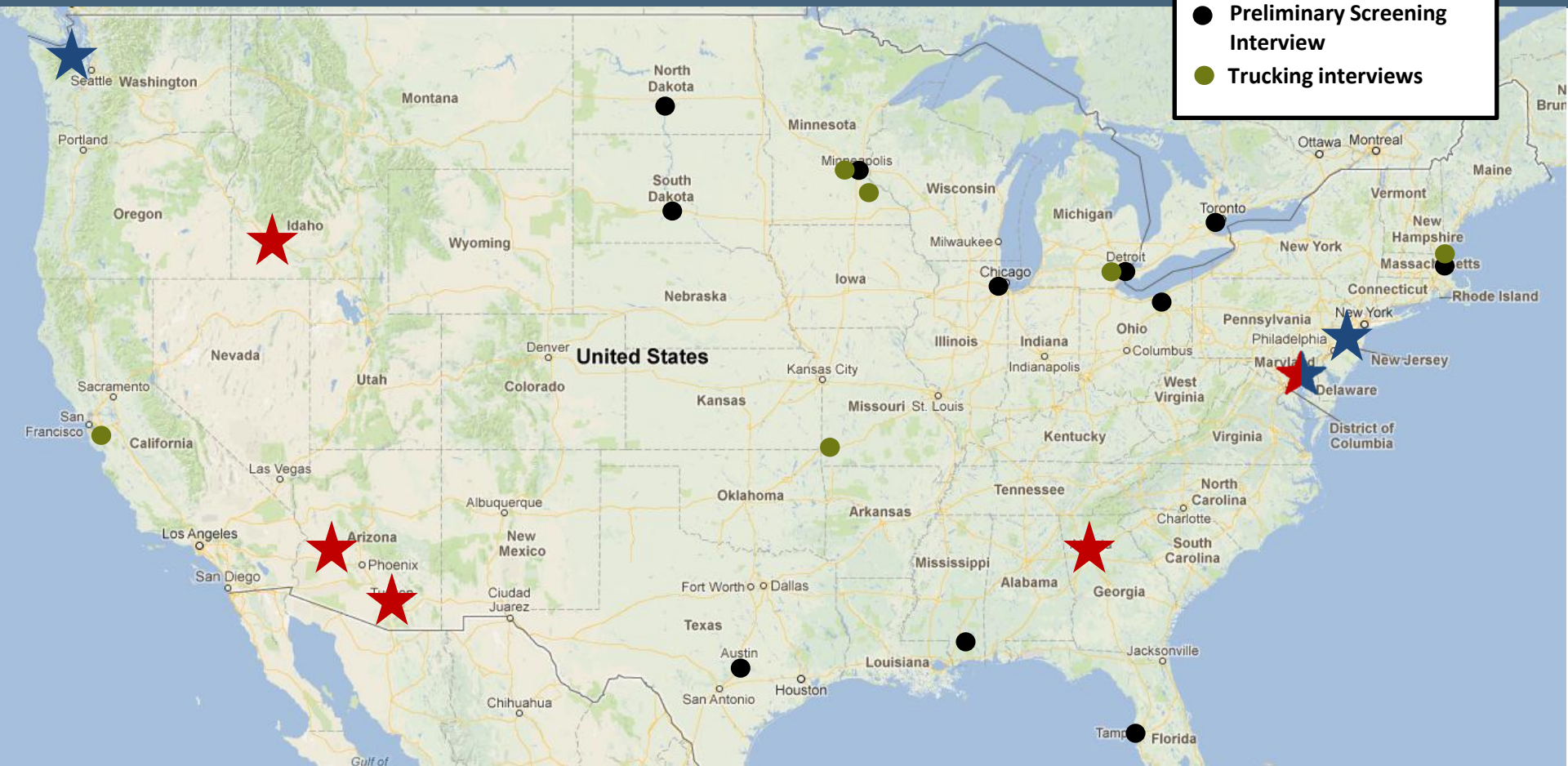
What are the most important factors that influence ITS Decision-Making?





# Diversity of Perspectives Achieved through Stakeholder Interviews

- ★ In-depth site visit
- ★ In-depth phone interviews
- Preliminary Screening Interview
- Trucking interviews



40+ public stakeholders in 30+ agencies engaged through in-depth interviews (some highlighted below)



# What are the Most Important Factors in ITS Decision-making?

## Public Sector Interview Transcript Analysis

28 Adoptions	4 Grow/Upgrades	14 Replacements	15 Cancel/Mitigate	22 Not Selected
<ul style="list-style-type: none"><li>• Demonstration of Benefits (16)</li><li>• Organizational Priorities (10)</li><li>• Readiness &amp; Maturity (7)</li><li>• Budget/Funding Sources (7)</li></ul>	<ul style="list-style-type: none"><li>• Demonstration of Benefits (2)</li><li>• Readiness &amp; Maturity (2)</li><li>• Budget / Funding Sources (2)</li></ul>	<ul style="list-style-type: none"><li>• Quality &amp; Reliability (9)</li><li>• Readiness &amp; Maturity (8)</li><li>• Demonstration of Benefits (7)</li></ul>	<ul style="list-style-type: none"><li>• Quality &amp; Reliability (5)</li><li>• Budget/Funding Sources (4)</li></ul>	<ul style="list-style-type: none"><li>• Quality &amp; Reliability (6)</li><li>• Readiness &amp; Maturity (6)</li><li>• Price (5)</li><li>• Perception of Risk (5)</li></ul>
<i>Note: number in parentheses shows the number of decisions in each category that cited each factor</i>				

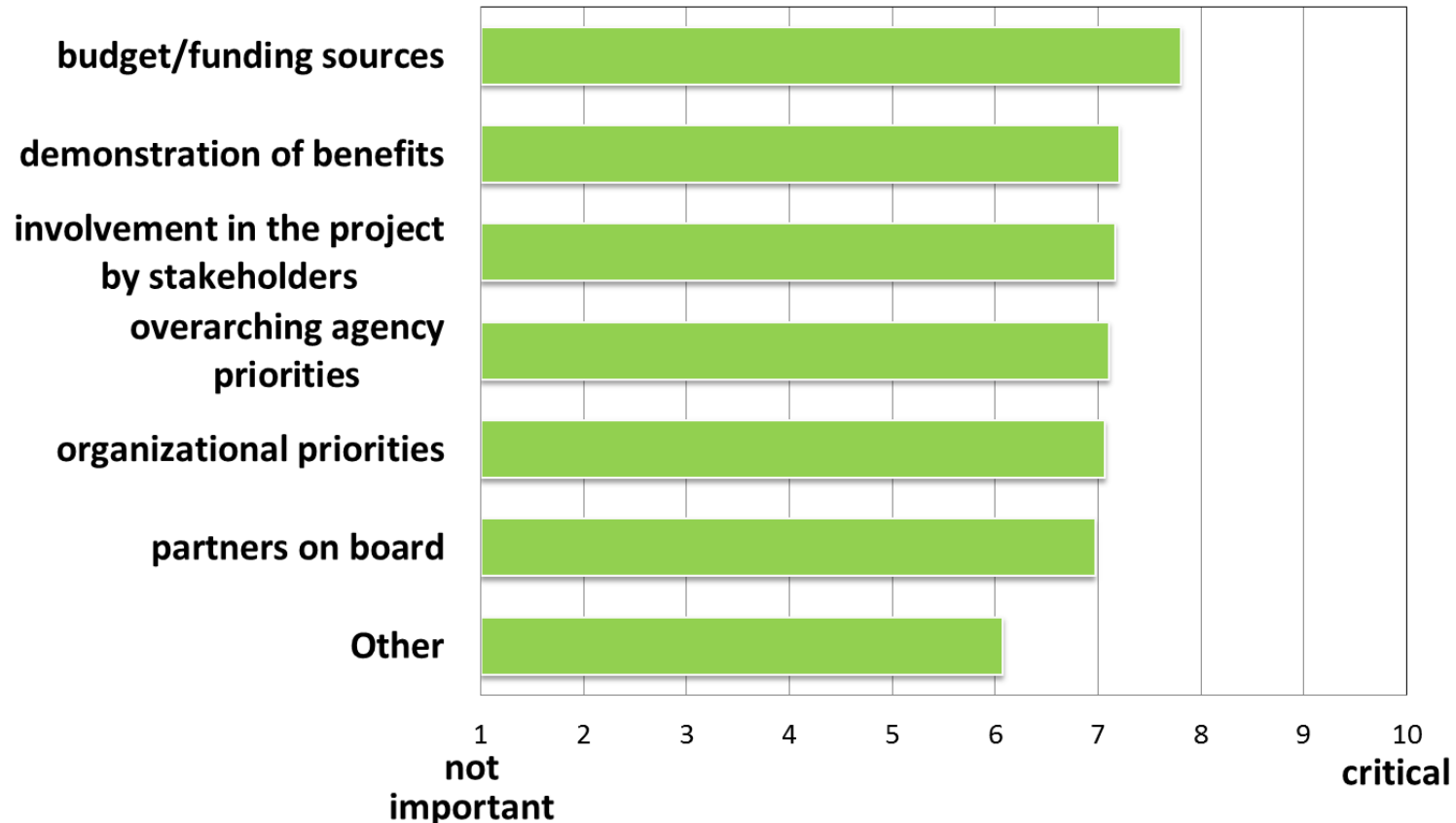
## Trucking Industry Interview Transcript/Rating Analysis

- Return-on-investment / price of the technology
- Readiness & maturity of the technology
- Compatibility with the existing systems
- System integration & flexibility
- Quality, reliability, service & support



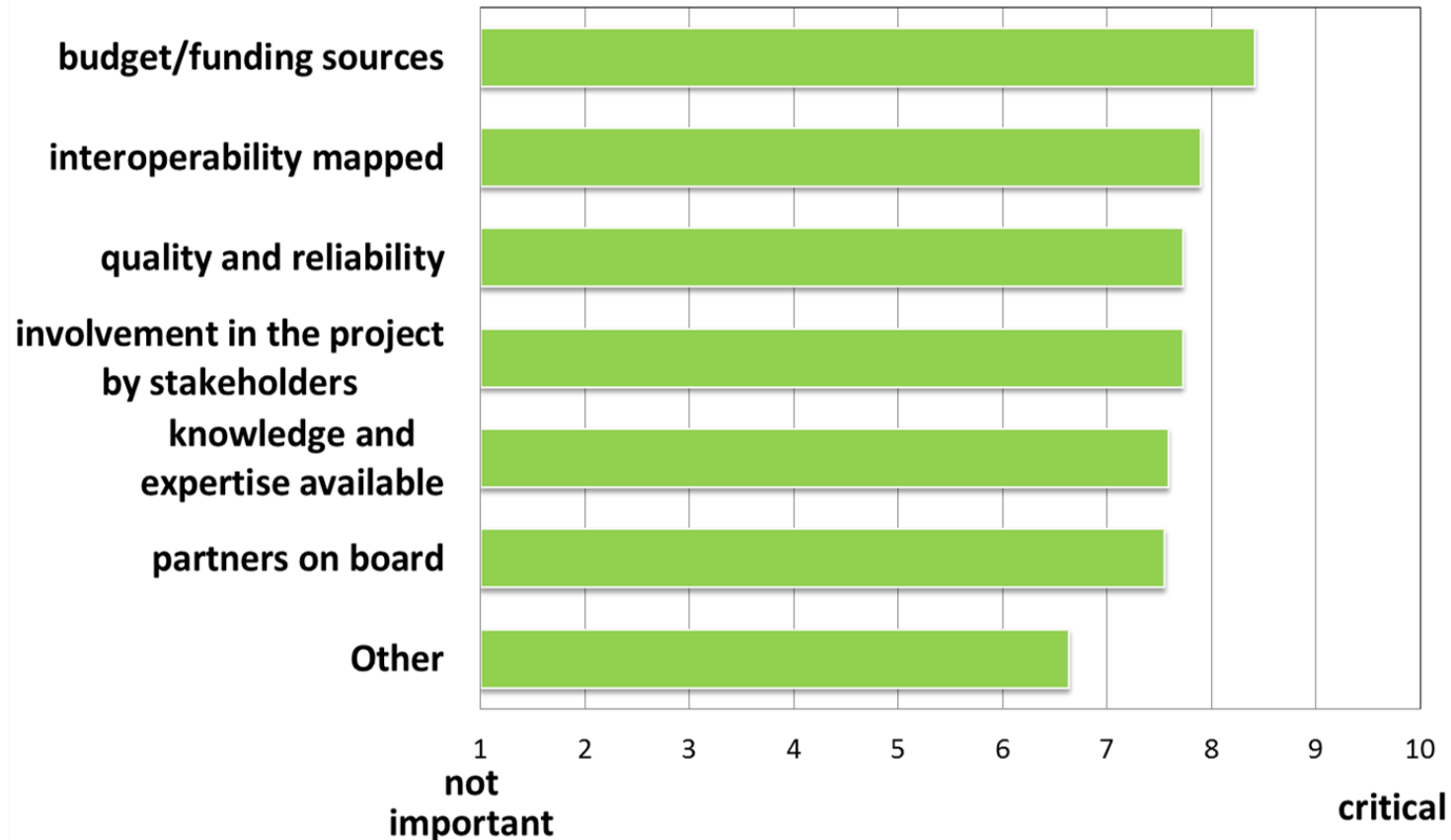
# Which Factors Most Affect Public Sector Decisions During Initiation Phase?

## ITS Implementation Process



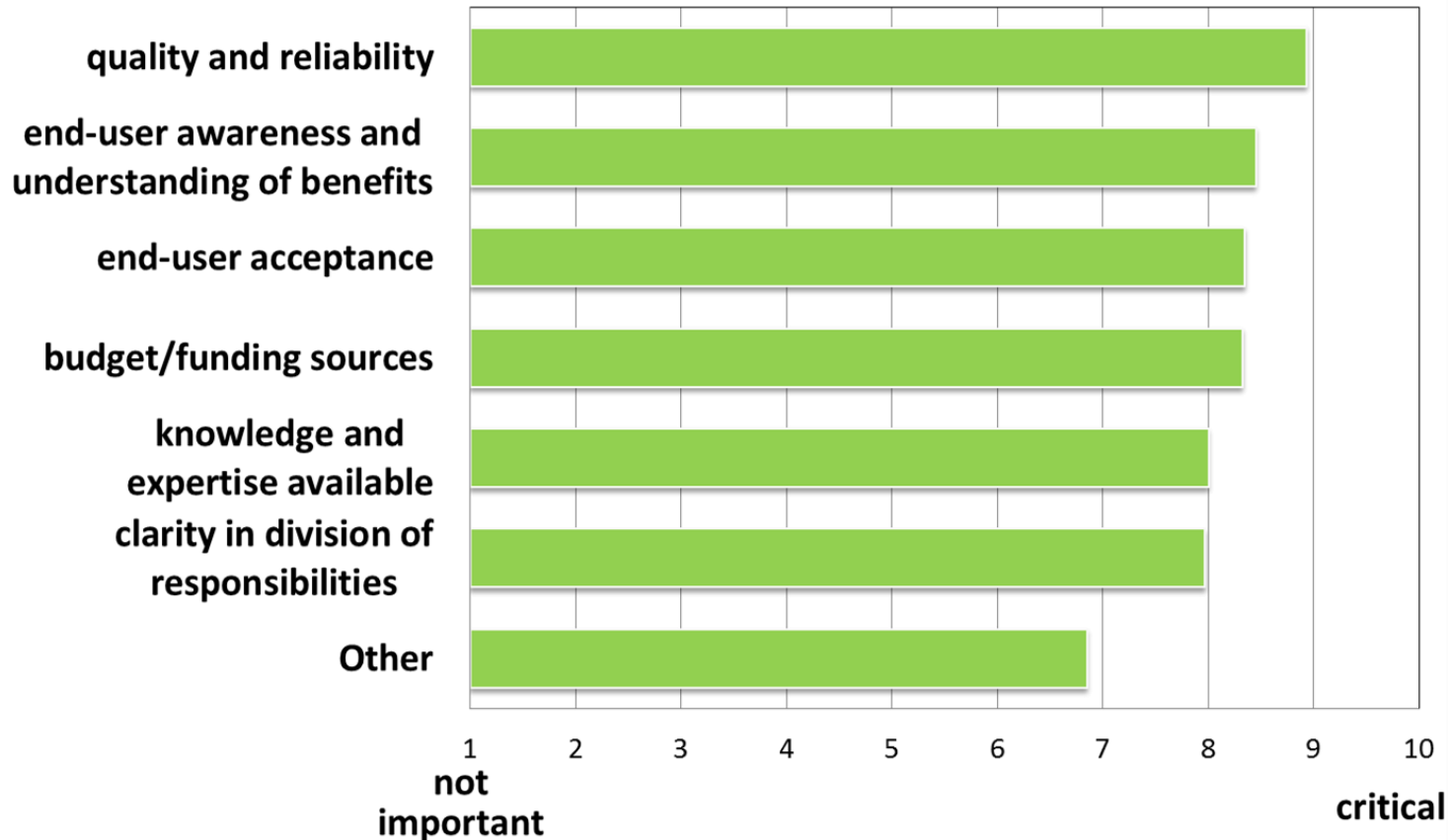
# Which Factors Most Affect Public Sector Decisions During Development Phase?

## ITS Implementation Process



# Which Factors Most Affect Public Sector Decisions During Deployment Phase?

## ITS Implementation Process



## Poll Question #1

**What sources do you most use to obtain information on the quality and reliability of ITS? (pick top 2)**

- a. Product literature and information from vendors
- b. Peer exchange/communication with others
- c. Own agency's experience and lessons learned
- d. Web-based research or industry resources
- e. Other (please type in the chat)
- f. No answer/ Not applicable

---

Q2.

How does continued operations or expansion of an ITS deployment affect level of benefits?

# Post Hoc Analysis –Did continued operation or expansion produce measurable effects?



## ***MnPass I-394 HOT Lanes and I-35 W HOT/HOV Expansion***

- I-394 speed and volume benefits sustained from years 2006 to 2012
- Lesser benefits on I-35W HOT expansion, but greater ROI



## ***Kansas City SCOUT's I-435 Ramp Metering***

- Volume and speed increases one year after implementation are sustained for subsequent year, Apr '11– Mar '12
- Incident clearance time reductions also maintained subsequent year



## ***Phoenix Arterial Traffic Signal Coordination-Scottsdale Rd***

- Regional growth & decline cause demand & speed fluctuations '02-'12
- Scottsdale Rd is more resilient with lower variations in travel speeds compared to parallel facility



## ***Portland Transit Tracker real time info at bus stops***

- Barbur Blvd. corridor routes with real-time bus arrival information outperform rest of system in ridership growth '01- '05
- After mobile ubiquitous access becomes available in 2006, corridor ridership growth advantage dissipates



# What Post-Hoc Analysis Teaches Us

- Results indicate that ongoing and expanded ITS implementations continue to produce measurable effects
  - In some cases, initial benefits can be sustained over time
  - In other cases, the benefits may change (often decrease) as the system infrastructure and operational strategies evolve
- Provides confidence that continued O&M on ITS deployments is prudent
- Need to factor in the cost side when comparing potential investments as incremental costs are often reduced as system expands
- Archived performance data from areas with sufficient data quality procedures CAN BE USED to support a post-hoc data analysis and look at trends over time, without the need to collect more field data!
- Offers a glimpse into performance-based management

---

Q3.

What information  
best support stakeholders  
in facilitating ITS Implementation?

# Federal and Peer Information Valuable

## ▪ **Public Sector - Evolution of ITS Decision Making**

- Peer influence increasingly important
- Regional Federal presence supports ITS Implementation

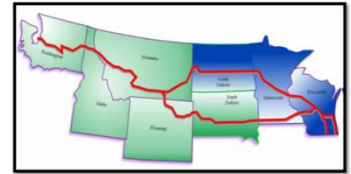


Image: Northwest Passage Pooled Fund Study

## ▪ **Public Sector – New Mandate for Performance Reporting**

- Some State and most MPO and Local agencies look to Federal guidance on
  - what and how to measure
  - cost of measurement versus cost of system
  - challenge finding technical expertise and resources for analysis



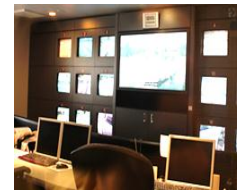
## ▪ **Public Sector - Importance of Interoperability and Integration**

- Need “best practices” and “lessons learned” on sharing resources such as communication infrastructure or TMCs with non-traditional transportation partners

**“Data rich,  
analysis  
poor”**

## ▪ **Trucking Industry**

- Government sponsorship of technology research/testing is critical
- Trickle down effect for technology from larger to smaller carriers



# Need for Workforce Education Also Cited

Key workforce education needs voiced by public sector include:

- Training related to incident management with Police/EMS
- Fundamental gap in historic training of transportation/civil engineers and today's ITS operations needs with expertise in:
  - Communication and software systems
  - Advanced tools for systems monitoring and operations
  - Understanding of policies/procedures for non-traditional agencies



---

Q4.

What can the U.S. DOT do  
to accelerate Next Generation ITS and  
the connected vehicle implementation?

## Poll Question #2

**How do you rate the probability of a connected vehicle environment being established in the next 15 years?**

- a. Very likely
- b. Somewhat likely
- c. Somewhat unlikely
- d. Very unlikely
- e. Not sure



# What We Heard From Workshop Stakeholders on *Moving to a Connected Vehicle Environment*



- ***Accelerate the timeline.....or risk becoming less influential***
- Focus on upcoming policy decisions
  - FCC decision regarding the 5.9 GHz spectrum allocation
  - NHTSA decisions related to possible rulemaking
- Recognize the need for “just right” amount of governance
- Demonstrate the value proposition for all stakeholders with measurable benefits
- Address funding models....how can agencies afford this?
- Increase awareness of state and local agency staff, decision makers, and the public
- Start building workforce capacity

# Synthesis: Considerations for Next Generation ITS and Connected Vehicles

1. Define and publicize benefits to promote interest
2. Educate the broader transportation community
3. Ensure demonstrations include diverse constituents
4. Recognize that private sector prefers a market driven approach while public sector seeks federal leadership
5. Support resolution of governance issues
6. Recognize presence of competing technologies
7. Reduce the likelihood for long-term risk aversion
8. Recognize that connected vehicle implementation needs a consistent national deployment approach



# ***1. Clearly define and publicize benefits for connected vehicle to promote stakeholder interest – taking into account differing needs and decision factors***

Many organizations unclear about the connected vehicles program

- Limited V2V applications awareness and far less V2I awareness
- What are the proposed applications?
- What is the eventual implementation period?
- How to get involved?

Decision makers are unsure of their role

- Concern of mandate without funding
- What is the benefits cost profile to support justification?



***“How do I get involved? I feel like we missed the boat”***

***“What is my role?”***

## Poll Question #3

### **Is your agency involved in the connected vehicles implementation?**

- a. Already involved (test bed location or research)
- b. Somewhat involved (looking into the technologies)
- c. Interested in becoming involved
- d. Interested in learning more
- e. No current plans for involvement

## *2. Educate and inform the transportation community through a broad suite of mechanisms*

Public sector expressed concern that existing and upcoming workforce does not possess the skills required for ITS operations

- Key gaps cited regarding IT/Communications and Software/Systems skills
- NJDOT partners with local university to help develop curriculum
- AzDOT encourages innovation and staff led projects

Constrained economic environment poses challenges in securing funding for workforce education and training

A Key Challenge for Consideration of CV and NextGen ITS will be workforce education.

- CV 101 training in underway
- Need for public awareness of cv benefits

Key pathways for education/training cited by the public sector include, PCB, AASHTO, APTA, and CVSA



## Poll Question #4A

**What topics would you like included in connected vehicle training offerings? (Pick up to 3)**

- a. Overview of connected vehicle research program
- b. Connected vehicle infrastructure concepts
- c. Connected vehicle applications
- d. Connected vehicle affiliated test beds
- e. Connected vehicle policy and institutional issues
- f. Potential benefits of connected vehicle technology
- g. Others? Please send using the chat box.



## Poll Question #4B

**Which of the following would be the best training option for you? (Pick up to 2)**

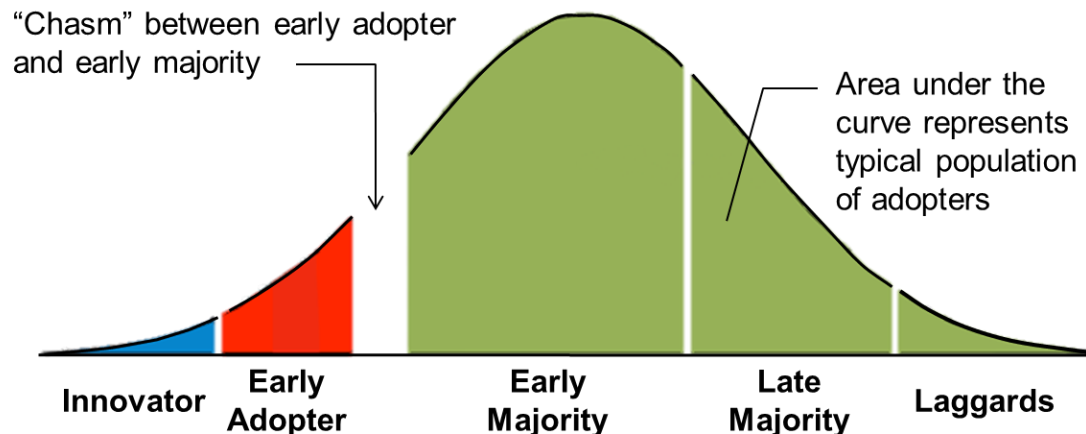
- a. Webinar
- b. In person 4 hour workshop
- c. In person 8 hour workshop
- d. Online course given in individual 1.5 hour modules
- e. Blended course with online portion and instructor-led discussions
- f. Longer course or series offered with a certificate in connected vehicle technology

### 3. *Ensure demonstrations include diverse constituents*

Agencies look to their peers' experiences in technology adoption; consequently, diversity of constituents should be represented in connected vehicle and next generation of ITS

Facets of diversity can include:

- Rural vs. Urban
- Laggards vs. Innovators
- Non-Traditional Transportation Agencies, e.g. Police, EMS



## ***4. Recognize that private sector prefers a market driven approach on the vehicle side , while public sector seeks stronger federal guidance on infrastructure side***

Both public and private sectors need a 'value proposition'

### Public Sector Perspectives

- Need federal government to define national standards
- Need guidance on applications and infrastructure options
- Concern of mandate without funding

### Private Sector Perspectives (auto-manufacturers)

- Prefer a market-driven deployment driven by end-user willingness-to-pay
- Desire flexibility if implementation is mandated
- Prefers stronger government role in establishing and implementing governance models
- Seeks long-term commitment from US Government to protect OEM investments



## Poll Question #5

**How important is the guidance of the federal government in your agency's development of a cv value proposition?**

- a. Very important
- b. Somewhat important
- c. Neutral
- d. Somewhat unimportant
- e. Unimportant

## ***5. Support resolution of governance issues including security, privacy, and adherence to standards***

OEMs satisfied with federal government research approach

However, many technical and policy challenges remain

- Standards, security, and governance
- Harmonization with Europe, Japan and North America
- Liability and insurance issues

## ***6. Recognize that competing technologies will temper consumer, trucking, and OEM enthusiasm for a connected vehicle rollout***

Concerns about competing technologies

- Radar, cameras, onboard sensors
- Other technological innovations
- Trucking companies multiple existing systems and devices, want an integrated system



## ***7. Reduce the likelihood for long-term risk aversion by establishing incremental successes with connected vehicle pilots and demonstrations***

Establish incremental successes with connected vehicle pilots and demonstrations

- Implementation of an unsuccessful GPS system by law enforcement agency, caused the agency not to invest in other technologies
- To ensure ITS implementation success, a large trucking company tests technology on a small portion of the fleet





## 8. *Recognize that connected vehicle implementation needs a consistent national deployment approach*

### Challenges from absence of a national system

- Different toll tag systems throughout the US
- Challenge with 511 content and structure crossing states

### Examples of seamless systems

- Credit cards/cell phones use any where

### Define national guidelines for connected vehicle implementation

- Minimize incompatible or duplicate systems from being developed
- Ensure a consistent deployment approach



# Thank you!

---

For more information, contact:

- James Pol  
Team Lead, Program Management and Evaluation  
ITS Joint Program Office (RITA)  
[James.Pol@dot.gov](mailto:James.Pol@dot.gov)
- Vaishali Shah  
Lead Analyst  
Noblis  
[Vaishali.Shah@noblis.org](mailto:Vaishali.Shah@noblis.org)
- Carolina Burnier  
Lead Analyst  
Noblis  
[Carolina.Burnier@noblis.org](mailto:Carolina.Burnier@noblis.org)